



## 2023 WILDLIFE REPORT

Ellis Bird Farm Ltd.

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## Table of Contents

1.	Introduction	2
2.	Methods	2
2.1.	First Arrival Date	2
2.2.	Nest Box Monitoring	2
2.3.	Purple Martin Monitoring	3
2.4.	Banding	3
2.5.	Breeding Bird Surveys	3
2.6.	Bat Roost Surveys	3
2.7.	Butterfly Counts	4
2.8.	Christmas Bird Count	4
2.9.	Bumblebee nest box monitoring	4
3.	Results	5
3.1.	First Arrival Date	5
3.2.	Nest Box Monitoring	6
3.2.1.	Mountain Bluebirds	6
3.2.2.	Mountain Bluebird Discussion	9
3.2.3.	Tree Swallows	10
3.2.4.	House Wren	11
3.2.5.	Boreal & Black-capped Chickadee	11
3.3.	Purple Martin Monitoring	11
3.4.	Banding	14
3.5.	Breeding Bird Surveys	14
3.6.	Bat Roost Surveys	17
3.7.	Butterfly Counts	17
3.8.	Christmas Bird Count	19
3.9.	Bumblebee Nestbox Monitoring	19
4.	Other Wildlife Research	19
4.1.	Owls	19
4.2.	eDNA Aquatic Sampling	19
	References	20
Appendix 1	2023 Bird List	21

## 1. Introduction

Ellis Bird Farm is a non-profit organization dedicated to conservation, education & sustainable agriculture. We promote environmental education and wildlife conservation, overseeing an extensive Mountain Bluebird, Tree Swallow, and Purple Martin monitoring program. We are located 11 km southeast of Lacombe and 18 km northeast of Red Deer, Alberta, west of the Prentiss Plant. Ellis Bird Farm was established in 1982 and one of its mandates is to carry out conservation of mountain bluebirds (*Sialia currucoides*), tree swallows (*Tachycineta bicolor*), purple martins (*Progne subis*) and other cavity nesting bird species.

To carry out their mandate, Ellis Bird Farm manages and monitors a nest box trail, a purple martin colony, and a section (640 acres) of land. The nest box trail falls within the Ellis Bird Farm Management Area (EBFMA; a 10 km radius from Ellis Bird Farm).

In addition to monitoring a purple martin colony and a nest box trail, breeding bird, bat roost and Christmas Bird Count surveys are completed. A great horned owl nest is monitored, and eBird checklists are submitted regularly throughout the season. Mountain bluebird and purple martin nestlings are typically banded.

## 2. Methods

### 2.1. First Arrival Date

First arrival dates of mountain bluebirds and tree swallows were collected anecdotally by Ellis Bird Farm. Nest box monitors including the Calgary Area Nest Box Monitoring Society, and the Alberta Birds Facebook group were notified to report records of mountain bluebirds arriving to the Ellis Bird Farm Management Area. eBird was also used to identify arriving mountain bluebirds. The date of the arrival of the nearest bird to Ellis Bird Farm (within 100 km), is considered the first arrival date of mountain bluebirds to Ellis Bird Farm's Management Area.

### 2.2. Nest Box Monitoring

Ellis Bird Farm is located approximately 11 km southeast of Lacombe, Alberta. Approximately 600 nest boxes are distributed in four blocks at the Ellis Bird Farm site and within the EBFMA. Block A-1 is east of EBF to Range Road 250; Block A-2 is west of EBF to Range Road 270; Block B is southwest of EBF and includes the area around Burbank, Blackfalds, and Blackfalds Lake, south to Township Road 390; and Block C consists of Ellis Bird Farm land, but does not include main site boxes. The trail was checked prior to the birds arriving in March to clean out, repair and set up new boxes as necessary. The boxes were checked weekly between early May and early August within daylight hours to record nest phenology, laying dates, number of eggs, hatching dates, hatching success, fledging dates and fledging success. Travel to the boxes was conducted on foot or by vehicle. If a bird started a nest, and the nest remained unfinished for the following two checks, the nest was removed at the second check and marked as failed. If an active nest (with eggs) was inactive for 1 week and eggs were cold, the nest was deemed "abandoned", eggs were disposed of, and nest material was removed. House sparrow nests were identified by the presence of adults and removed where applicable because they are introduced species and compete with native cavity nesters for nests. Nest checks were suspended when there was

precipitation, or the temperature was above 30°C or below 2°C. After the birds had left the boxes, nests were removed.

### *2.3. Purple Martin Monitoring*

Purple martin monitoring began in early June and continued until late July. Monitoring followed protocols established by the Purple Martin Conservancy, an organization that Ellis Bird Farm has partnered with for over 20 years. Nest checks typically occur every seventh day during daylight hours, however checks were suspended during and immediately after heavy rain events to reduce stress on the colony. Condos were lowered with the winch and each floor was detachable to allow the monitor to observe the contents of each nest. Due to heavy rain events and previous stresses on the colony from previous year, under direction from the Purple Martin Conservancy site checks were put on hold July 7<sup>th</sup>.

When blowfly larvae, fleas, and mites were observed in the nest, and the nestlings were between the ages of 5 and 17 days old, nest changes were conducted by removing the nestlings and nest material from the box, torching the interior of the cavity with a propane torch to kill the parasites, adding new nest material, and returning the nestlings to the nest. Data was collected on nest status; number of eggs, nestlings, and fledglings; age of nestlings; presence of nest parasites; and whether a nest change occurred.

### *2.4. Banding*

Banding was performed with banding pliers, and federal numbered aluminum bands obtained from the Bird Banding Lab. An aluminum band was applied to the right leg of mountain bluebirds and purple martins, following the protocol from previous years. A scientific permit to capture and band migratory birds from Environment and Climate Change Canada was obtained prior to banding. Banding occurred when the temperature was above 5°C or below 25°C, and there was no precipitation.

Mountain bluebird nestlings were pulled out of their nest, placed in a container, banded, weighed, and tarsus measured, then returned to their nest. Banding occurred between the ages of 11 and 13 days to prevent early fledging.

Purple martin nestlings were not banded in 2023 to reduce stresses on the colony.

### *2.5. Breeding Bird Surveys*

Breeding bird surveys began early May and ended late June. Surveys were conducted within a 100 m radius of the station and all birds detected by sight or sound were recorded. Behaviour (e.g. soaring, flying, loafing) of each bird, sex and age if known, and number of birds were recorded. The survey lasted for ten minutes and began half an hour before sunrise until surveys were completed, or 10:30 hours, whichever occurred first. An equal number of stations were selected in all habitats (e.g. pasture, trees). Any birds detected outside of the 100 m radius were recorded as incidentals. Flybys and select species that have large home ranges (e.g. gulls, raptors) were considered incidentals and excluded from analysis.

### *2.6. Bat Roost Surveys*

Four bat roost counts were conducted between June 1 and August 1, 2023. Bat count survey dates followed protocols from the Alberta Community Bat Program. Surveyors arrived at least 15 minutes before sunset and counted bats exiting the bat house for one hour, or until it was too dark to see,

whichever came first. No lights were used; the surveyor sat so the bat roost was backlit to see the bats emerge from the house. Surveyors counted bats using a clicker; whenever bats flew back into the roost, they stopped counting until an equivalent number exited, and then continued counting as more bats exited. Surveys were conducted when air temperature was at least 12°C, with low wind speed and no precipitation.

### *2.7. Butterfly Counts*

Dr Delano Lewis conducted butterfly counts during the summer of 2023. A citizen science butterfly count was started in 2023 with trained volunteers conducting butterfly counts throughout the summer. In addition, at the annual Bug Jamboree, Benny Acorn conducted and led another butterfly count. All butterflies identifiable to at least genus level within 5 meters of where the observer was walking were counted; a constant pace was maintained, with occasional stops to record or attempt at catching butterflies that needed a closer examination to determine species. Each count lasted approximately 1 hour. The route taken was the same used by Benny Acorn in 2020; it started by doing a loop around the main site starting at the visitor's center, then going down the path to the pond and butterfly garden, walking up past the cafe and old visitors center to the parking lot. From the parking lot one would then walk down the road to the west woods and stop at the entrance to the west woods. This approximately 1 km path gave a good variety of habitat for butterflies and was easily accessible.

### *2.8. Christmas Bird Count*

The survey was conducted by walking a pre-determined route, and recording all birds detected by site and sound. Carolyn Ross conducted the 2023 survey which started at the bird feeders beside the Café, then travelled down the driveway, past the wetlands and along the Farm Road. Surveys were conducted when wind speeds were below 20 kilometers per hour.

### *2.9. Bumblebee nest box monitoring*

Nine bumblebee nest boxes were placed around the main site following Alberta Native Bee Council's bumblebee nestbox protocols. The nestboxes were filled with raw cotton batting and placed at various heights and habitats. Boxes were placed in mid-April after snow cover was gone.

### 3. Results

#### 3.1. First Arrival Date

The first mountain bluebird observation in Alberta was on March 18 near Pincher Creek. eBird records show mountain bluebirds in the Calgary area on March 24<sup>th</sup>. First sightings of mountain bluebirds within 100 km of Ellis Bird Farm occurred on March 28, 2023, so that is considered the first arrival date for the EBFMA (Figure 1).

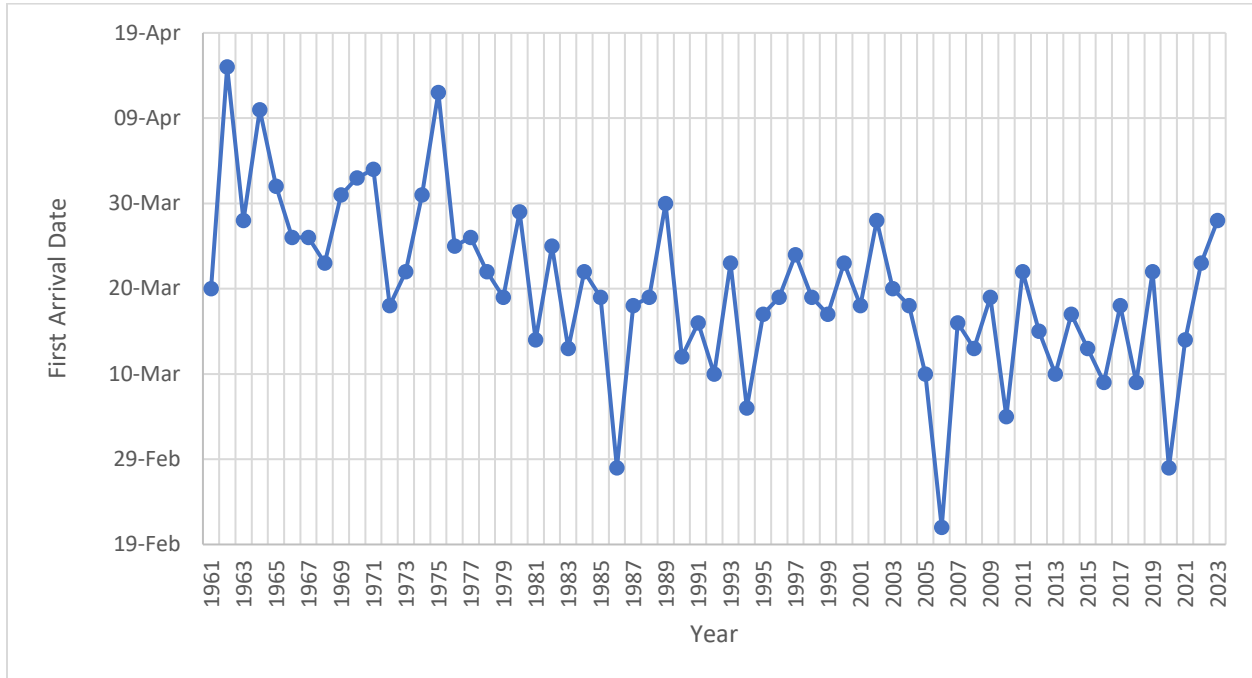


Figure 1. Mountain bluebird first arrival dates for the Ellis Bird Farm area 1961-2023.

According to eBird, the first tree swallow reported in the High River area was April 11<sup>th</sup> with sightings in Calgary on April 19<sup>th</sup>. In Central Alberta, the earliest sighting was on April 18<sup>th</sup> at Slack Slough near Red Deer. Figure 2 shows first arrival dates for tree swallows since 1958. The earliest arrival date was April 2 in 1986, and the latest date was May 7 in 1959.

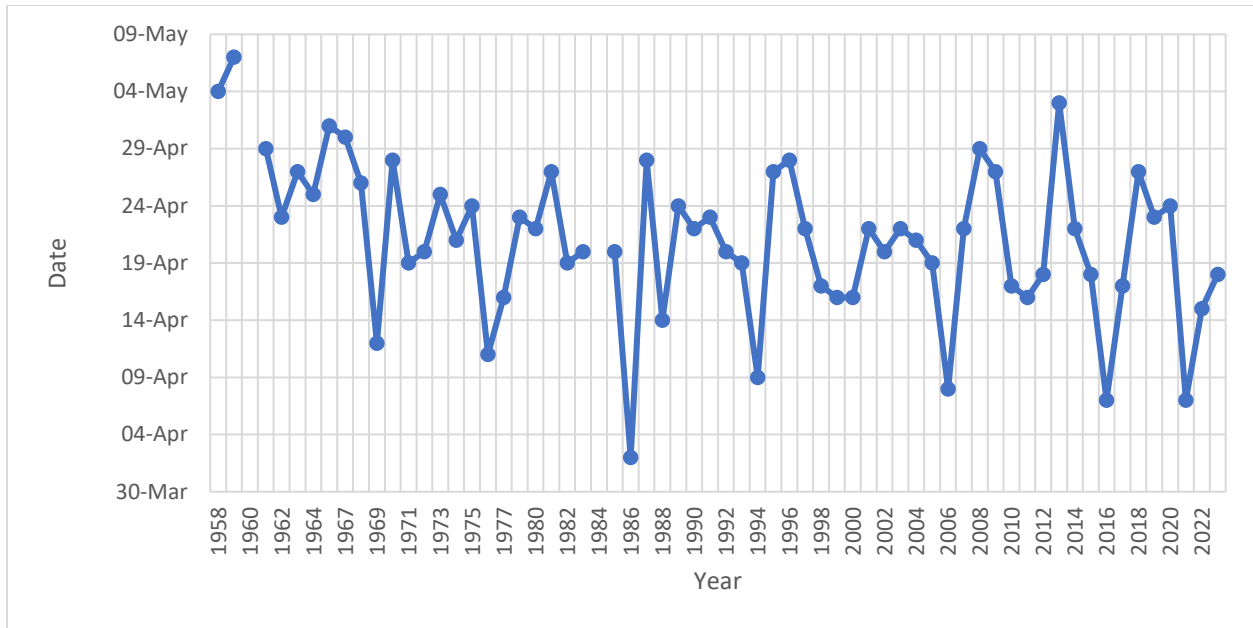


Figure 2. Tree swallow first arrival dates for the Ellis Bird Farm area since 1958. Data is missing for 1960 and 1984.

The first purple martins arrived at Ellis Bird Farm on May 3, 2023, compared to April 28 in 2022.

### 3.2. Nest Box Monitoring

A total of 690 nest boxes, including 419 nest boxes on the nest box trail, and 271 nest boxes at the main Ellis Bird Farm site were monitored by Ellis Bird Farm in 2023. Research assistant Madisen Asante conducted most of the monitoring, with assistance from Maureen Carey and Dr Natalia Lifshitz. Nest box checks began May 1 and continued until August 9th.

#### 3.2.1. Mountain Bluebirds

An estimated 31 breeding pairs of mountain bluebirds attempted (laid at least one egg) 31 nests in 2023. This is an increase from an estimated 22 pairs that attempted 29 nests the previous year. Since 2008, the highest number of breeding pairs and nesting attempts was in 2012 (n = 50, 72). There were 22 initial nesting attempts, and 9 second or late nests this year (nests that hatch after June 20 is considered a late or second nest attempt). A total of 162 eggs were laid and 123 young hatched. 120 young fledged, a decrease from 145 in the previous year. The average survival of a mountain bluebird egg was 82.5% in 2023; and eggs laid per nesting attempt in 2023 (n = 5.2) was the same as the average (n = 5.2) (Table 1).

Table 1. Nesting success of mountain bluebirds on the Ellis Bird Farm nest box trail between 2000 and 2023.

Year	Eggs Laid per Nesting Attempt	Hatching Success (%)	Fledgling Survival from Egg (%)	Fledgling Survival from Nestling (%)	Average Survival (%)*
2023	5.2	76.0	74.0	97.6	82.5
2022	5.6	92.5	89.5	96.7	92.9
2021	5.3	91.1	87.5	96.1	91.5
2020	5.3	85.9	78.1	90.9	85.0
2019	5.5	80.0	67.2	84.1	77.1
2018	5.4	83.6	71.2	85.2	80.0
2017	5.5	81.7	76.4	93.5	83.9
2016	5.3	83.6	78.9	94.3	85.6
2015	5.6	77.3	76.0	98.3	83.9
2014	5.2	86.8	81.6	93.9	87.5
2013	5.3	87.6	81.7	93.3	87.5
2012	5.3	83.6	72.7	86.9	81.1
2011	5.2	82.0	75.2	91.7	82.9
2010	5.4	81.8	72.9	89.1	81.3
2009	5.1	83.4	81.9	98.1	87.8
2008	5.1	85.1	74.3	87.3	82.3
2007	5.1	77.5	71.5	92.3	80.4
2006	5.0	82.8	78.0	94.2	85.0
2005	4.9	89.2	83.7	93.8	88.9
2004	5.0	86.5	86.2	99.6	90.8
2003	4.9	70.0	57.8	82.5	70.1
2002	5.4	88.9	80.0	90.0	86.3
2001	4.9	75.2	67.9	90.3	77.8
2000	5.3	84.7	73.9	87.3	82.0

Note: \*Average survival is an average of columns 3-5.

Following the trend of the past 22 years, the first/early clutches were larger than the second/late clutches (Figure 3). This year’s average first/early clutch size (n = 5.36) was below the 23 year average of 5.6. This year’s second/late average clutch size was 4.88 eggs per nesting attempt, just above the 23-year average of 4.81.



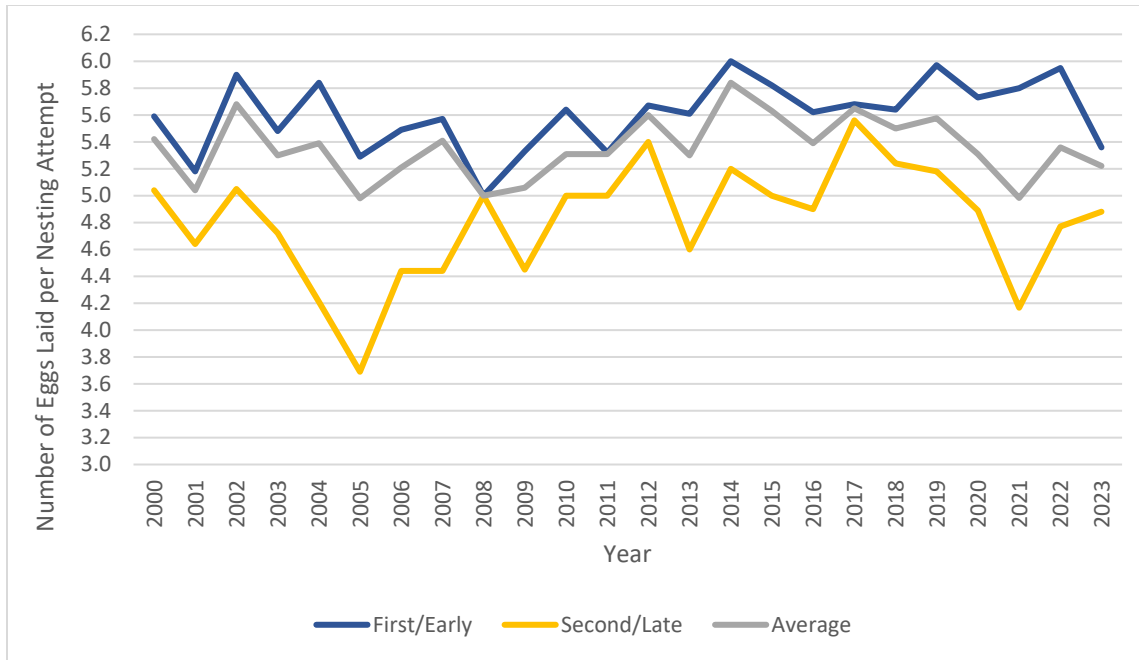


Figure 3. Mountain bluebird eggs laid per first and second/late nest attempts, including average eggs laid on the Ellis Bird Farm nest box trail in the past 23 years.

In 2023, most nests where at least one bird fledged had a clutch size of 5 eggs (n = 38%) followed by nests with 6 eggs (n = 35%), nests with 4 eggs (n=15%) and 7 eggs (n = 12%) (Figure 4). Between 2001 and 2023, the average percent of nests with one fledgling containing 6 eggs was 46%, followed by 5 eggs at 32%, 4 eggs at 11% and 7eggs at 8%. Prior to 2023, the most eggs laid in a nest with at least one bird fledged was 8, and the least was 2, and in 2023, the largest clutch size was 7 and the least was 4.

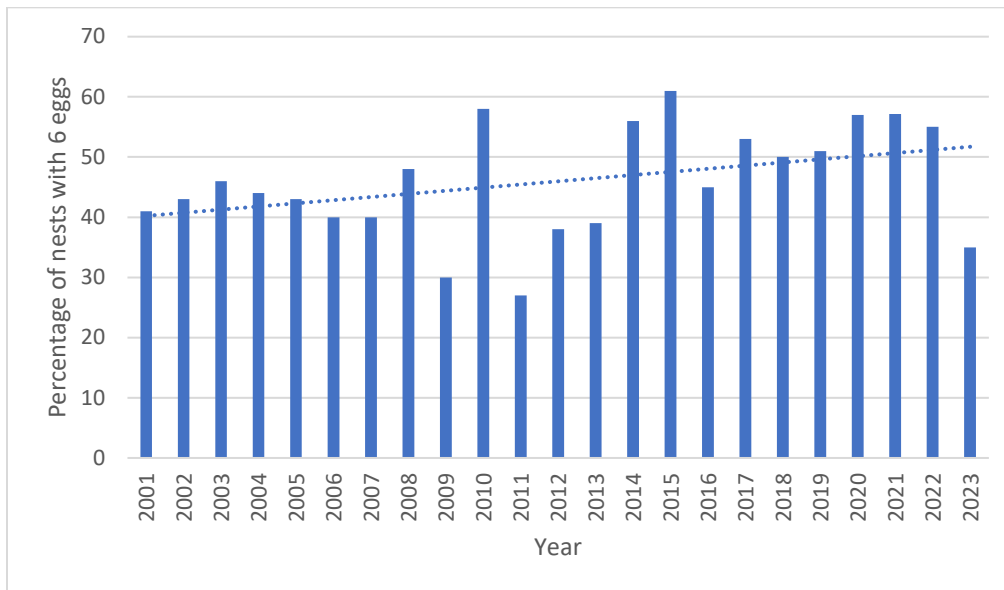


Figure 4. Percentage of mountain bluebird nests where at least one bird fledged with six eggs on the Ellis Bird Farm nest box trail in the past 23 years.

Since 2005, an average of 55.5% of mountain bluebird nests hatched between May 24 and June 6 (Figure 5). Between 2005 and 2023, hatchings at mountain bluebird nests started in the first week of May and ended in the first few days of August. In 2023, the majority of hatchings (n = 33%) occurred between May 24 and May 31. 74% of hatchings occurred between May 17 and June 20 and 26% occurred between June 21 and August 3.

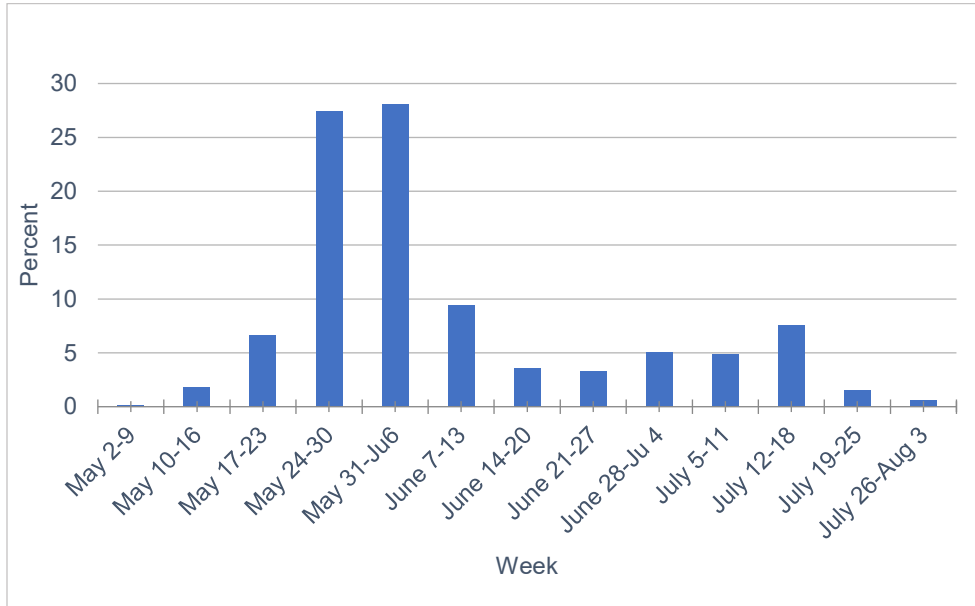


Figure 5. Average percent of mountain bluebird nests hatched per week between 2005 and 2023 on the Ellis Bird Farm nest box trail.

### 3.2.2. Mountain Bluebird Discussion

Mountain bluebird populations within the EBFMA have increased in the 2023 season and had average survival rates. However, mountain bluebird populations remain lower than historical levels with less breeding pairs and nest attempts. There are a couple of potential factors at play, which are still hypothetical, as there are insufficient peer reviewed publications that discuss why mountain bluebird and other songbird populations appear to have declined in recent years. In August and September of 2020, a large die-off of migrating birds throughout the southwest US occurred, and mountain bluebirds were among the birds discovered. In all cases, birds were found in emaciated condition, likely starved to death and many birds also showed respiratory damage. The mortality event is still being studied, but the hypotheses are that smoke caused by wildfires and cold weather and snow caused the birds to starve to death (Johnson, 2020; Weston, 2020). Additionally, in February 2021, there was a cold snap in Texas with extreme cold temperatures (-20°F recorded at Palo Duro Reservoir MESONET weather site [Burkhead, 2021]), and large amounts of snow (8 inches in some regions [Burkhead, 2021]). The cold weather persisted for over a week, which caused mortality in not only birds, but all kinds of wildlife, including bats and turtles. Bluebirds were among the hardest hit birds, although an article published by The Associated Press (2021) does not specify which species of bluebird.

According to North American Breeding Bird Survey data (Smith et al. 2020), mountain bluebird populations have declined 24% between 1966 and 2015 at a continental scale and scientists blame habitat loss as a major contributing factor. The bluebird population at Ellis Bird Farm has been similarly

trending downward, with a decline of 51% fewer nesting pairs over the last 23 years. A snowstorm in 2008 devastated Ellis Bird Farm’s population, causing a 62% drop in nesting pairs in one year and this year was the second worst on record at Ellis Bird Farm.

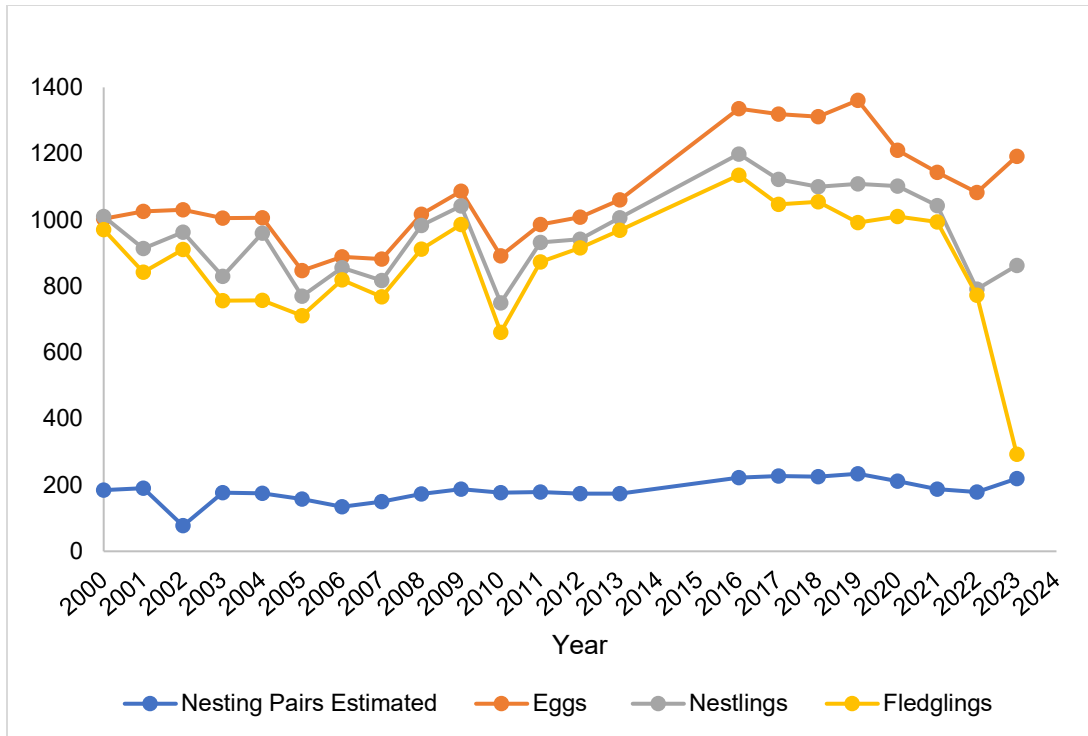
### 3.2.3. Tree Swallows

In 2023, 213 nesting attempts by tree swallows resulted in 1,192 eggs laid, 863 nestlings, and 293 fledglings during a heavily weather influenced nesting season. This year’s nestling survival from egg (n = 72.4%), fledgling survival from egg (n = 24.6%) and fledgling survival from nestling (n = 33.9%) was significantly below the 20-year average (Table 2). Eggs laid per nesting attempt was below average 5.8 with 5.4 this year. Nestbox monitors across Alberta experienced high mortality in June due to heavy rain events and an unusual amount of second nest attempts occurred in July 2023.

Table 2. Nesting success of tree swallows on the Ellis Bird Farm nest box trail from 2001 – 2023. Data is missing for 2014 and 2015.

Year	Eggs Laid per Nesting Attempt	Nestling Survival from Egg (%)	Fledgling Survival from Egg (%)	Fledgling Survival from Nestling (%)	Average Survival (%)*
2001	5.4	89.1	82.1	92.1	87.8
2002	5.8	93.4	88.4	94.6	92.1
2003	5.7	82.6	75.2	91.1	83.0
2004	5.7	95.4	75.2	78.9	83.2
2005	5.4	90.9	83.9	92.3	89.1
2006	6.6	96.3	92.1	95.7	94.7
2007	5.9	92.6	87.1	94.0	91.2
2008	5.9	96.7	89.7	92.8	93.0
2009	5.8	95.9	90.7	94.6	93.7
2010	5.0	84.1	74.1	88.1	82.1
2011	5.5	94.5	88.5	93.7	92.2
2012	5.8	93.5	90.9	97.2	93.9
2013	6.1	94.8	91.3	96.3	94.2
2016	6.1	89.7	85.0	94.7	89.8
2017	5.8	85.1	79.4	93.3	85.9
2018	5.8	83.8	80.4	95.9	86.7
2019	5.8	81.5	72.9	89.4	81.3
2020	5.7	91.1	83.5	91.7	88.7
2021	6.1	91.2	86.9	95.3	91.1
2022	6.1	73.0	71.4	97.7	80.7
2023	5.8	72.4	24.6	33.9	43.6

Note: \*Average survival is an average of columns 3-5.



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#### 3.2.4. House Wren

43 house wren pairs nested on the main site and the nest box trail resulting resulting in 75 eggs. Nestling success and fledgling success was not known due to observation difficulties.

#### 3.2.5. Boreal & Black-capped Chickadee

There was one Boreal chickadee and two black-capped chickadee nests on the nest box trail in 2023. Nestling success and fledgling success was not known due to observation difficulties.

### 3.3. Purple Martin Monitoring

Purple martins were monitored beginning July 7, and the last nest check occurred on August 11, after all birds had fledged. Monitoring was led by volunteers John Bontje and Ulla Bruhn-Crouch. There were seven purple martin houses with 12 cavities each available for use in 2023 (Figure 6). Houses 1-4 were Purple Martin Conservancy V5 style houses, and Houses 7-9 were Jim Boyd houses. Cavity occupation was 77% overall, including gourds. There were 9 gourds available on the spider rack, of which 6 gourds were occupied.



Figure 6. Location of purple martin houses at Ellis Bird Farm in 2023.

In 2022, there was a decline in purple martin nestling and fledgling survival overall compared to the previous three years (Table 4). A total of 263 eggs, 108 nestlings and 72 fledglings were produced from 72 attempted nests (i.e., 72 pairs of nesting purple martins; Figure 7). This is a decrease from 264 eggs, 164 nestlings and 156 fledglings that were produced from 62 attempted nests in 2022.

While the number of nest attempts was higher, and similar number of eggs laid this season, survival of young purple martins was severely low likely due to heavy extended precipitation events in the end of June to early July. There were 113 eggs collected from unsuccessful nests at the end of season. When examined under light, all of these eggs showed little to no embryo development. Adult and subadult activity remained high throughout the summer (i.e. low adult mortality). The reason for nest failure is unknown, it is suspected that the adverse weather affected adult foraging and potentially lack of food and cold rainy weather resulted in failure to incubate eggs. Weather records show 81 mm of rain fell on June 14 and 15<sup>th</sup>. The rainy weather abated slightly but continued to June 22. The lowest temperature was recorded on June 22 at 2.2°C. Associated with the cold wet weather, winds were also strong (40-65kmph) throughout this period. Due the level of environmental stress on the colony, the annual banding did not take place mid-July.

Table 4. Nesting success of purple martins at the Ellis Bird Farm purple martin colony from 2007-2023.

<b>Year</b>	<b>Eggs Laid per Nesting Attempt</b>	<b>Nestling Survival From Egg</b>	<b>Fledgling Survival From Egg</b>	<b>Fledgling Survival From Nestling</b>	<b>Average Survival</b>
2007	4.3	78.0%	77.3%	99.1%	84.8%
2008	5.0	80.3%	76.0%	94.7%	83.6%
2009	4.8	86.7%	78.2%	90.2%	85.1%
2010	4.9	81.0%	68.6%	84.7%	78.1%
2011	4.9	84.2%	83.6%	99.2%	89.0%
2012	4.5	84.7%	78.3%	92.5%	85.1%
2013	4.8	86.7%	80.8%	93.1%	86.9%
2014	4.6	84.9%	80.3%	94.6%	86.6%
2015	4.8	88.4%	86.4%	97.8%	90.9%
2016	4.8	86.1%	84.4%	98.1%	89.5%
2017	4.7	84.1%	81.6%	97.1%	87.6%
2018	4.8	77.4%	69.5%	89.8%	78.9%
2019	4.7	70.2%	45.8%	65.3%	60.4%
2020	4.9	75.6%	58.6%	77.6%	70.6%
2021	4.7	85.5%	70.6%	82.6%	79.5%
2022	4.3	62.1%	59.0%	95.1%	72.1%
2023	3.65	41.1%	27.3%	66.7%	45.0%

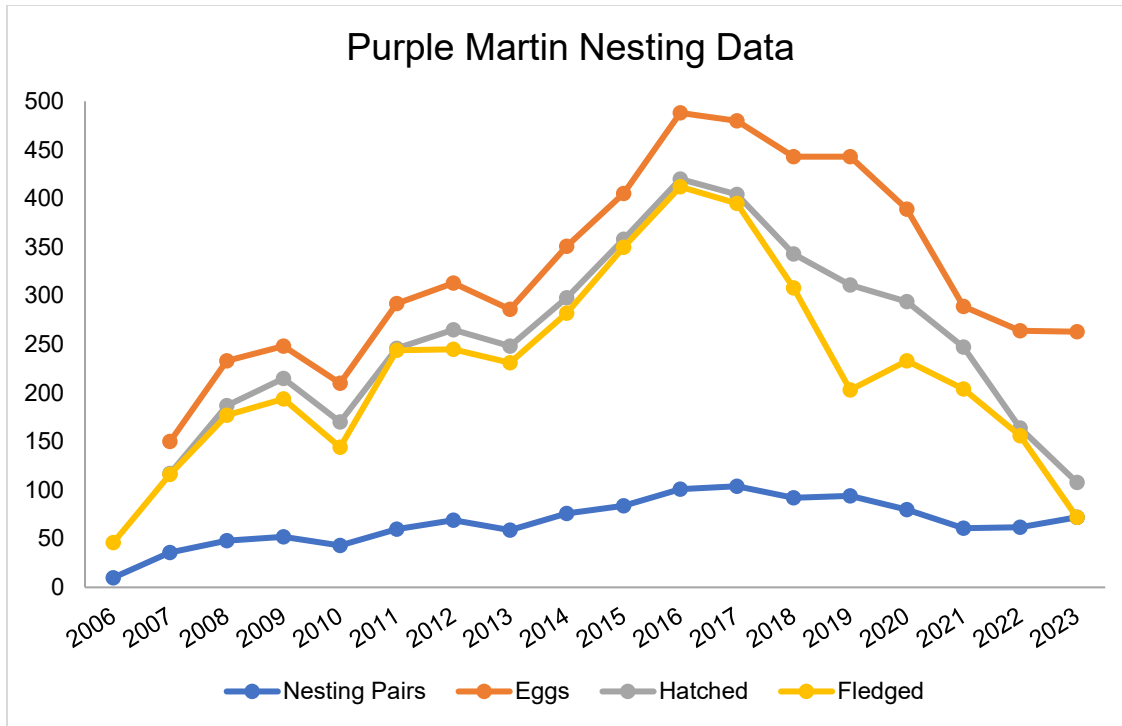


Figure 7. Purple martin nesting data for the Ellis Bird Farm purple martin colony between 2006 and 2022. Note – missing number of eggs and nestlings for 2006.

### 3.4. Banding

Banding was led by Dr. Natalia Lifshitz who was the bander in charge of the Station permit and assisted by Madisen Asante and Carolyn Ross.

Mountain bluebird nestlings were banded as a part of an ongoing banding effort by Ellis Bird Farm to track local movements. Banding occurred between June 6 and July 29, 2023, whenever nestlings were the appropriate age. A total of 110 juveniles from 24 nests were banded. No adults were captured for banding, and two nests were not banded, due to weather and/or due to error in aging.

### 3.5. Breeding Bird Surveys

Breeding bird surveys were conducted at fifteen points twice between May 13 and June 17 by Rachael Firminger and Madisen Asante (Figure 8). Thirty-nine species were detected during surveys. Point 7 & 2 had the highest richness with 19 and 16 species, followed by Point 6 with 15 species. Point 10 contained the lowest number of species with 7 species. Clay-colored sparrow, red-winged blackbird, American robin and tree swallow had the greatest number of individuals and most widespread species was clay-colored sparrow detected at 13 of 15 points.

In most cases, breeding birds observed during surveys were added to eBird by staff, and any species not listed in eBird were added to the list in Appendix 1.

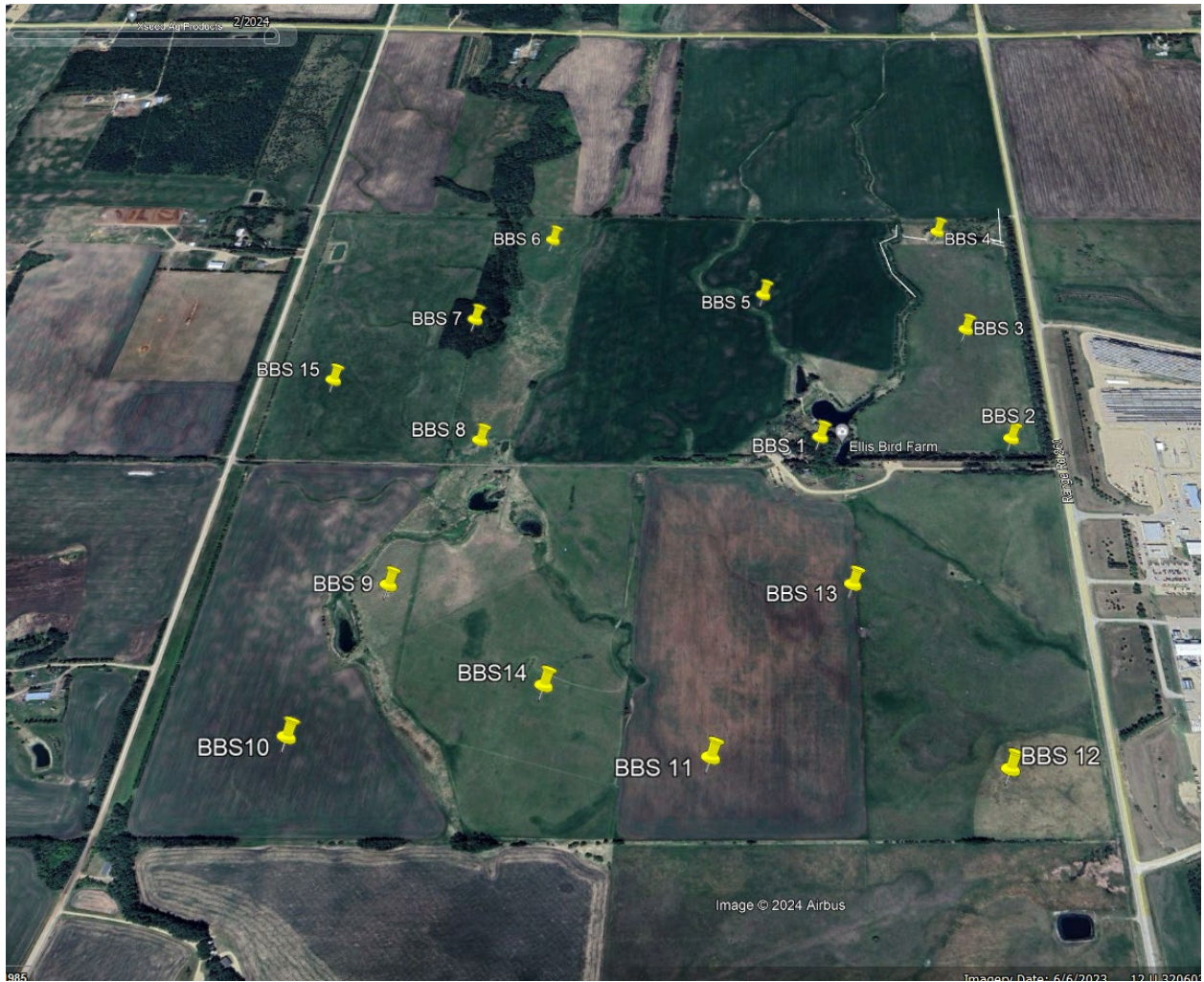


Figure 8. Locations of survey points for Ellis Bird Farm breeding bird surveys in 2023.



Table 5. Bird species detected at Ellis Bird Farm during breeding bird surveys in 2023.

<b>Species</b>	<b>Number of Individuals</b>
Canada Goose	18
Mallard	12
Blue-winged Teal	1
Northern Shoveler	1
Lesser Scaup	2
Common Goldeneye	5
Ruddy Duck	2
Swainson's Hawk	1
Red-tailed Hawk	1
Spotted Sandpiper	1
Wilson's Snipe	3
Yellow-bellied Sapsucker	2
Downy Woodpecker	1
Hairy Woodpecker	1
Western Wood Pewee	1
Least Flycatcher	10
Eastern Kingbird	2
Blue Jay	1
Black-billed Magpie	14
American Crow	2
Purple Martin	5
Tree Swallow	77
Barn Swallow	1
Black-capped Chickadee	13
House Wren	3
American Robin	24
European Starling	2
Yellow Warbler	17
Yellow-rumped Warbler	2
Chipping Sparrow	1
Clay-coloured Sparrow	79
Vesper Sparrow	3
Savanah Sparrow	4
LeConte's Sparrow	2
Song Sparrow	1
Red-winged Blackbird	65
Brewer's Blackbird	4
Baltimore Oriole	1
American Goldfinch	1

### 3.6. Bat Roost Surveys

Bat roost surveys were conducted by Madisen Asante, and Carolyn Ross with assistance from Eve Stange, Jessie Campbell and Logan Calihoo. Counts were conducted on the little brown myotis box on the north and south sides of the Grain Elevator and the big brown bat box on the calving barn. Four counts were conducted from June 6 to August 1<sup>st</sup>. The temperature during the bat counts ranged from 14°C-18°C. The highest count was 230 little brown myotis bats at south Grain Elevator box on July 6 2023 (Figure 9). The north box on the Grain Elevator was not counted in previous years, but with the addition of volunteers we were able to include it this year. The highest count was 140 little brown myotis on June 22 count. The Calving barn box held 45 big brown bats on June 22. By August 1, the number of bats dropped significantly down to 58 at south Grain Elevator, 26 at north Grain Elevator and 32 at Calving Barn.

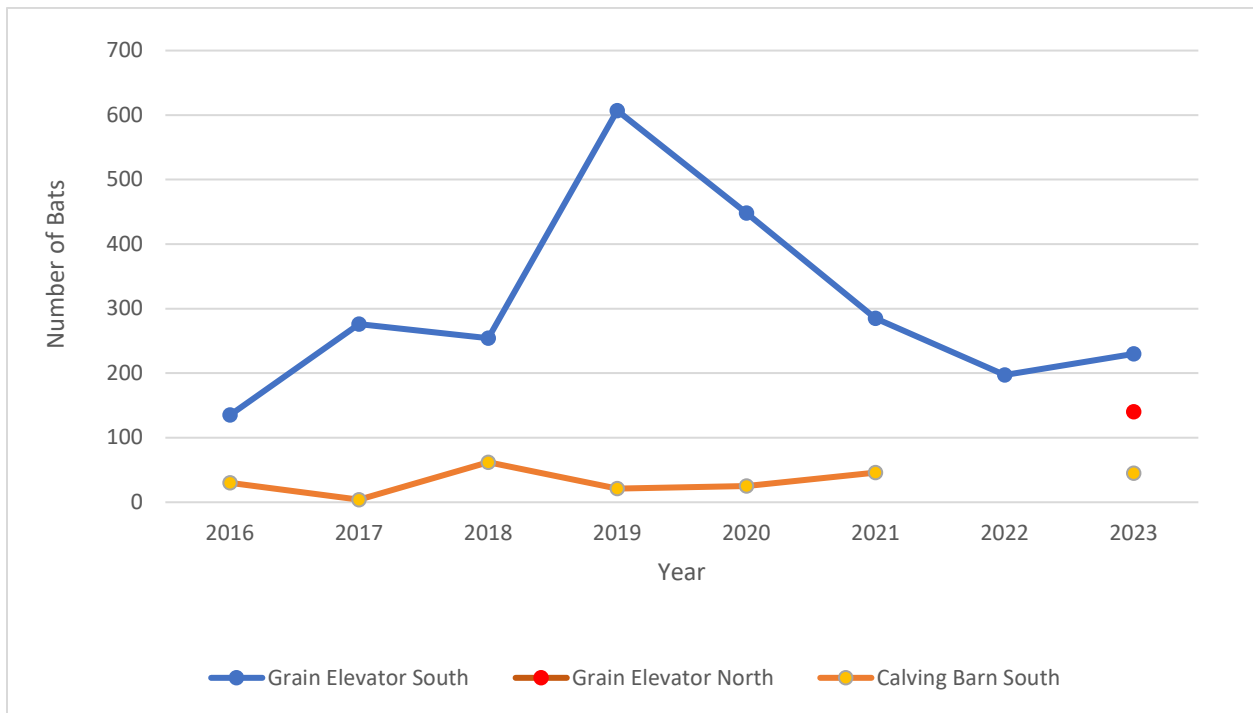


Figure 9. Highest number of bats recorded at boxes at Ellis Bird Farm since 2016.

### 3.7. Butterfly Counts

Butterfly counts were conducted by Dr. Delano Lewis with assistance from Naia Holtom and the Butterfly Count volunteers. A total of 29 counts were conducted over 88 days and 28 species were seen along the route. All Fritillary species were grouped together due to difficulty in identifying to species level. In addition to the season long butterfly counts, Benny Acorn conducted a butterfly count at Bug Jamboree on August 12<sup>th</sup>, 2023. Table 6 lists the species observed in 2023 at EBF. Dr Lewis has been tracked the abundance of species and the most common species in the past three years have been clouded sulphur, cabbage white and European skipper (Table 7).

Table 6. Butterfly species observed in 2023 during the Butterfly Counts and Bug Jamboree

Scientific Name	Common Name
<i>Papilio canadensis</i>	Canadian Tiger Swallowtail
<i>Pontia occidentalis</i>	Western White
<i>Pieris rapae</i>	Cabbage White
<i>Colias philodice</i>	Clouded Sulphur
<i>Celastrina lucia</i>	Northern Azure
<i>Cupido amyntula</i>	Western Tailed Blue
<i>Glaucopsyche lygdamus</i>	Silvery Blue
<i>Plebejus saepiolus</i>	Greenish Blue
<i>Fritiliary sp</i>	Fritiliary sp
<i>Aglais milberti</i>	Milbert's Tortoiseshell
<i>Nymphalis antiopa</i>	Mourning Cloak
<i>Polygonia satyrus</i>	Satyr Comma
<i>Vanessa atalanta</i>	Red Admiral
<i>Vanessa cardui</i>	Painted Lady
<i>Phyciodes cocyta</i>	Northern Crescent
<i>Limenitis arthemis</i>	White Admiral
<i>Cercyonis pegala</i>	Common Wood Nymph
<i>Coenonympha californica</i>	Ringlet
<i>Erebia epipsodea</i>	Common Alpine
<i>Erebia discoidalis</i>	Red-Disked Alpine
<i>Carterocephalus palaemon</i>	Arctic Skipper
<i>Oarisma garita</i>	Garita Skipper
<i>Polites mystic</i>	Long Dash Skipper
<i>Polites themistocles</i>	Tawny-edged Skipper
<i>Thymelicus lineola</i>	European Skipper
<i>Pyrgus communis</i>	Checkered Skipper
<i>Lycaena helloides</i>	Purplish Copper
<i>Phyciodes cocyta</i> *	Northern Crescent
<i>Ochlodes sylvanoides</i> *	Woodland Skipper

\*Species only observed by B. Acorn August 2023.

Table 7. Butterfly Species: top 5 species observed ranked greatest to least abundance.

2023	2022	2021
Clouded sulphur	European Skipper	Cabbage White
Cabbage White	Cabbage White	European Skipper
European Skipper	Ringlet	Clouded Sulphur
Fritiliary sp	Clouded Sulphur	Common Wood Nymph
Northern Crescent	Silvery blue	Ringlet

### *3.8. Christmas Bird Count*

The 2023 Christmas Bird Count was conducted on December 19 2023 by Carolyn Ross. The survey was conducted on foot. Twelve species were observed at Ellis Bird Farm during the count (Table 6).

Table 6. Birds observed during the December 19, 2023 Christmas Bird Count at Ellis Bird Farm.

<b>Species</b>	<b>Individuals</b>
Rock Pigeon	3
Downy Woodpecker	2
Blue Jay	3
Common Raven	1
Black-billed Magpie	2
Black-capped Chickadee	7
White-breasted Nuthatch	1
Red-breasted nuthatch	3
Common redpoll	2

### *3.9. Bumblebee Nestbox Monitoring*

None of the nine bumblebee nestboxes were occupied in 2023. The boxes were retrieved in the fall and cleaned out (bedding removed).

## 4. Other Wildlife Research

### *4.1. Owls*

A new great horned owl nest camera was installed by Phase 3 Security and began streaming in January 2023. Activity was observed on the nest during late January with the pair starting nesting activity by mid-February. Three eggs were laid on Mar 4, 8, and 12th with the young owlets hatched between April 7 and 13<sup>th</sup>. The 3 owlets were banded by Judy Boyd from Medicine River Wildlife Centre and Rick Morse from Boreal Avian Research and Conservation Association on April 27, 2023. All owlets successfully fledged and were often observed on site throughout the summer.

### *4.2. eDNA Aquatic Sampling*

Patrick Hannington from University of Alberta and his student Brooke McPhail collected samples from Sandpiper and the main wetland (dipping pond) at Ellis as part of their three-year project titled “Early detection and rapid response to aquatic invasive species and species at risk using environmental (e)DNA and metabarcoding”.

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## Appendix 1 2023 Bird List

Table 9. A list of all bird species observed by staff and recorded in eBird during formal surveys or tours or incidentally on the Ellis Bird Farm property in 2023.

Canada Goose	Northern Flicker	Le Conte's Sparrow
Blue-winged Teal	American Kestrel <sup>1</sup>	Nelson's Sparrow
Northern Pintail	Merlin	Chipping Sparrow
Northern Shoveler	Western wood-pewee <sup>2</sup>	Clay-colored Sparrow
Mallard	Least Flycatcher <sup>1</sup>	Dark-eyed Junco
Gadwall	Eastern Kingbird <sup>1</sup>	White-crowned Sparrow
American Wigeon	Warbling Vireo	White-throated Sparrow
Redhead	Red-eyed Vireo	Harris Sparrow
Lesser Scaup	Blue-headed vireo	Vesper Sparrow
Ring-necked Duck	Blue Jay	Savannah Sparrow
Common Goldeneye	Black-billed magpie	Song Sparrow
Gray Partridge	American Crow	Lincoln's Sparrow
Horned Grebe <sup>1,4</sup>	Common Raven	Western Tanager
American White Pelican <sup>1</sup>	Purple Martin <sup>1</sup>	Bobolink <sup>1</sup>
Great Blue Heron <sup>1</sup>	Tree Swallow	Baltimore Oriole
Northern Harrier	Barn Swallow	Red-winged Blackbird
Sharp-shinned Hawk	Black-capped Chickadee	Brown-headed Cowbird
Bald Eagle <sup>1</sup>	Boreal Chickadee	Brewer's Blackbird
Swainson's Hawk	Red-breasted Nuthatch	Common Grackle
Red-tailed Hawk	White-breasted Nuthatch	Pine Grosbeak
Sora <sup>1</sup>	House Wren	Common Redpoll
Killdeer	Mountain Bluebird	House Finch
Wilson's Snipe	American Robin	Purple Finch
Spotted Sandpiper	Gray Catbird	Pine Siskin
Solitary Sandpiper	Bohemian Waxwing	American Goldfinch
Lesser Yellowlegs	Cedar Waxwing	House Sparrow
Least Sandpiper	Ovenbird	European Starling
Franklin's Gull	Northern Waterthrush	
Ring-billed Gull	Magnolia warbler	
Rock Pigeon	Tennessee Warbler	
Great Horned Owl	American Redstart	
Ruby-throated Hummingbird	Yellow Warbler	
Belted Kingfisher	Common Yellowthroat <sup>1</sup>	
Yellow-bellied Sapsucker	Yellow-rumped Warbler	
Downy Woodpecker		
Hairy Woodpecker		
Note: <sup>1</sup> Sensitive, <sup>2</sup> May be at Risk, <sup>3</sup> At Risk (AEP 2023)		